

Remarks/Arguments

Applicant respectfully requests further examination and reconsideration in view of the above amendments and arguments set forth fully below. Claims 1-127 were previously pending in the present application. By way of the above amendments, Claims 45-127 are withdrawn. Accordingly, Claims 1-127 are currently pending in this application.

Restriction of Invention

Within the Office Action, Claims 1-127 are subject to restriction to one of the following inventions: I. Claims 1-87, drawn to a heat exchanger, classified in class 165, subclass 80.4, and II. Claims 88-127, drawn to a method of manufacturing, classified in class 29, subclass—.

The Applicants elect examination of Invention I including claims 1-87, without traverse, for continued prosecution. The Applicants expressly reserve the right to file one or more divisional applications directed toward the non-elected invention.

Election of Species

Further, the Claims 1-127 are also subject to Election of Species to one of a very large number patentably distinct species allegedly claimed within the instant application. These include the following:

Fluid Providing System

- First species of FIG. 2A, and
- Second species of FIG. 2B.

Fluid Phase

- First species where the fluid does not change phase in the heat exchanger, and
- Second species where the fluid does change phase in the heat exchanger.

Thermoelectric System

- First species without a thermoelectric system,
- Second species with a thermoelectric device integrally formed within the heat exchanger,
- Third species with a thermoelectric device integrally formed within the heat source, and
- Fourth species with a thermoelectric device coupled to both the heat exchanger and the heat source.

Layers

- First species of heat exchanger having three layers, and

Second species of heat exchanger having two layers.

Three Layer Systems

- First species of FIGS. 3A-3B,
- Second species of FIGS. 4, 5, and 6A-6B,
- Third species of FIGS. 8a-8c,
- Fourth species of FIG. 9A,
- Fifth species of FIG. 11,
- Sixth species of FIGS. 12A, 12D, 12H,
- Seventh species of FIGS. 12B, 12C, 12I,
- Eighth species of FIGS. 12A or 12B heat exchanger using the FIG. 12D variant,
- Ninth species of FIGS. 12A or 12B heat exchanger using the FIG. 12E variant,
- Tenth species of FIGS. 12A or 12B heat exchanger using the FIG. 12F variant,
- Eleventh species of FIGS. 12A or 12B heat exchanger using the FIG. 12G variant,
- Twelfth species of FIGS. 12A or 12B heat exchanger using the FIG. 13 variant,
- Thirteenth species of FIGS. 12A or 12B heat exchanger using the FIG. 14 variant, and
- Fourteenth species of Figure 17.

Two Layer Systems

- First species of FIG. 7A,
- Second species of FIG. 7B,
- Third species of FIG. 9B, and
- Fourth species of FIGS. 18-20.

Interface

- First species of FIG. 3B, e.g. walls 110,
- Second species of FIG. 10A,
- Third species of FIG. 10B,
- Fourth species of FIG. 10C,
- Fifth species of FIG. 10D,

Sixth species of FIG. 10E, and
Seventh species of FIG. 8C.

The species are allegedly independent or distinct because they are mutually exclusive and burdensome to search.

The Applicants traverse the election of species requirement as being incomplete. The requirement does not fully set forth all the species described within the instant application. Limiting the Applicants to the species described within the restriction requirement deprives the Applicants of the full scope of their invention.

Specifically, the Applicants point out that the instant invention includes a species of three-layer system as in 3A and 3B that includes a thermoelectric device. As stated in the original application on page 13, line __, with reference to the heat exchanger 100 of FIG. 3A and 3B:

In addition, a thermoelectric device 97 is alternatively configured in between the thermal interface material 98 and the heat source 99.

More detail of the thermoelectric device 97 is discussed below.

Further, the Applicants point out that the interface layer of FIG. 3A and 3B can be a porous structure. As stated in the original application on page 22, line __, with reference to the heat exchanger 100 of FIG. 3A and 3B:

It is also apparent that any other features, besides microchannel walls 110 are also contemplated, including, but not limited to roughed surfaces and a micro-porous structure, such as sintered metal and silicon foam. However, for exemplary purposes, the parallel microchannel walls 110 shown in Figure 3B is used to describe the interface layer 102 in the present invention.

Further, the Applicants point out that a porous interface layer is disclosed with reference to FIG. 10A. As stated in the original application on page 19, line __:

It is apparent that the interface layer 302 can include only the microporous structure 301 as well as a combination of the microporous structure with any other interface layer feature (e.g. microchannels, pillars, etc.).

Elected Species

The Applicants hereby elect a species of invention I as in the Restriction of Invention section above including the following characteristics:

A first species of fluid providing system of Fig. 2A, with

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A first species of fluid phase characteristics, wherein the fluid does not change phase in the heat exchanger, with

A fourth species of thermoelectric system, wherein the thermoelectric device is coupled to both the heat exchanger and the heat source, with

A first species of heat exchanger having three layers, in particular

A first species of FIG. 3A-3B as described, with a thermoelectric device, and

An interface layer as described with reference to FIGS. 3A, 3B, and 10A.

Readable Claims

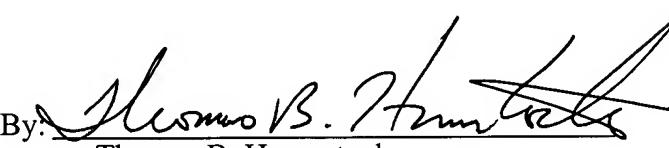
The Applicants submit that claims 1-3, 6-8, 13, 14, 16, 17, 19, 28-37, and 44 are readable on the elected species. Further, the Applicants submit that claim 1 is generic to all species.

The Applicants respectfully request examination and reconsideration in view of the amendments above and remarks above. Following the above amendment, Claims 1-127 are currently pending. Should the Examiner have any questions or comments, he or she is encouraged to call the undersigned at (408) 530-9700 to discuss the same so that any outstanding issues can be expeditiously resolved.

Respectfully submitted,
HAVERSTOCK & OWENS LLP

Dated: 8-21-06

By:


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CERTIFICATE OF MAILING (37 CFR § 1.8(a))
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